the Pacific coast. The best known of these is off what is known as 'Coal-Oil Point,' about one and one-fourth miles west of Goleta, and ten miles west of Santa Barbara. Captain Van Helmes, of the American steamship 'Los Angeles,' says that when a vessel passes through this region the smell of the oil is so strong as frequently to cause nausea among passengers and crew, and in certain spots the oil can be distinctly seen bubbling up on the surface. Captain Wallace, of the American steamship 'City of Chester,' has also seen oil floating on the water to the north of Cape Mendocino, from three to five miles off shore, and thinks there is another spring there. Captain Plummer, of the American steamship 'Gipsy,' says the belt of oil above Santa Barbara can be seen on the darkest night when sailing through it. Captain Goodall, of the Pacific Steamship Company, says of the region off Coal-Oil Point, that on a calm day the water is covered for miles with oil, bubbles of which can be seen rising to the surface and spreading over it. Although it does not seem to smooth the water like animal oil, yet, on a windy day, one can see a smooth slick of oil on the surface. This spot is so well known by shipmasters, that the smell of the oil is used as a guide in foggy weather, the petroleum smell being so strong that a captain can never mistake his position when off that point. Captain Goodall says, also, that he has noticed a small flow of oil from the bottom of the sea off Cojo Point, near Point Conception, but there the amount of oil is very small. It cannot be seen bubbling from the bottom, but is often visible on the surface, the odor being very perceptible.

HEALTH MATTERS.

Scarlet-Fever.

THE following striking instance, illustrating the communicability of scarlet-fever, is sent us by Dr. George E. Goodfellow of Tombstone, Arizona, in answer to the letter of inquiry sent by *Science* some months ago: —

"I came to Prescott, Arizona, in 1876. At that time I was informed by physicians residing there for a number of years, that, to their knowledge, no case of scarlet-fever ever had been known either in the town or surrounding country. Prescott is a pleasant little mountain town of central Arizona, and at that time had a population of about eighteen hundred, and had been then, and is now, considered to be unusually free from disease. The altitude is about 5,800 feet. There was no sewerage system, nor was one needed. In this climate of the South-West, owing to the dryness of the atmosphere, excrementitious material desiccates so rapidly, and the residents are so unaccustomed to the vile odors of civilization, that they never have realized the necessity of supplying the pabulum of putrefaction, in the shape of water, to their sewage. There was not a foul-smelling outhouse in the town, save around the saloons and some restaurants; and there, be it noted, no one lived; neither was any one there, taken sick in the epidemic, to be recounted. I speak thus authoritatively of the condition of the village, for I was appointed health-officer, therefore knew the state of things. One more preliminary statement. Of the people living in Prescott and the encompassing neighborhood, almost all were considered as old residents; that is, they had emigrated to Arizona about 1862–64, mostly from the Pacific coast. There was comparatively little immigration into the Territory from 1868 to 1876–77. By reason of this, the children imported from California left that State before the advent there extensively of scarlet-fever and kindred diseases, and were now grown to manhood and womanhood without ever having had any of the contagious diseases of childhood. Many of these, particularly the girls, were married and had children; and it was among these children that the disease which proved so fatal started. Whatever the differences of opinion concerning the first cases, which made their appearance in May or June, 1877, the nature and malignancy of the fever were soon conceded by even the most sceptical. It was scarlet-fever in its most malignant form, and, if I recollect aright, it swept away between twenty and thirty children in that small burg before it ceased. But it was not confined to the children: the parents, particularly the young mothers, as described above, contracted the fever in all grades of severity, though usually in a mild form. There was a family, prominent in the place, with three children, aged from two to eight. I was the medical attendant. The eldest contracted the disease first, and in a few days the others had it. Two of them died about the seventh day, — the two younger ones. The other ultimately recovered. Owing to the popularity of the family, a large number of visitors, sympathizing friends, and curious neighbors, as is usual in small towns, had filled the place, spite of all protests from the physician, from the beginning of the trouble until the sad ending. Of the immediate friends, a large number were of the younger class heretofore described, that never had had scarlet-fever. Of these, the majority were taken down with some form of sickness related to the disease. Most of them had the fever outright, but some only had severe sore throats. The father, mother, consulting physician, and myself were all attacked. Whether I ever had had the fever, I do not know. The father, two young men, and myself, who had been closely in contact with the children from the beginning of their illness, lay at the point of death for some days; and, of all who were in the house, not one escaped without some manifestation of the disease. Thus effectually was the fever spread. It seems to me this is a striking illustration of the communicability of the disease. Of course, the objection may be raised, the sanitary conditions of the house were not good. But they were. The house was a new one, a year old, of wood, set up from the ground by short two-by-four scantling, so that the wind had an elegant chance to ventilate the building. There was no cesspool, or foul locus of any sort, in the neighborhood. It was, in fact, an ideally clean place. Some of those who had typical cases of the fever were twenty-four and twenty-five years of age.

"Now, here was an epidemic, which, so far as we knew at the beginning, had no antecedent case to initiate it. My subsequent investigations settled that point. It was ascertained that the previous year, at Fort Whipple, an army post near the edge of town, there had been some cases of what the post surgeon pronounced scarlet-fever. Thus died the case of the *de novo*ites. At any rate, the *onus probandi* of origin was put on the preceding year's cases. Where they came from, never was shown certainly; but as some families had recently joined the station, coming from infected points, it was a natural supposition to conclude that they brought it with them. This is the strongest concatenation of circumstances, derived from personal observation, I can give. I have not entered into details showing absence of other sources of contagion in the persons attacked. This must be assumed as having been established at the time."

VACCINATION STATISTICS. — The following extract from *The Sanitarian* would seem to indicate that a compulsory vaccination law has its advantages: "The success of the anti-vaccinationists is aptly shown by the results in Zurich, Switzerland, where for a number of years, until 1883, a compulsory vaccination law obtained, and small-pox was wholly prevented (not a single case occurred in 1882). This result was seized upon in the following year by the anti-vaccinationists, and used against the necessity for any such law, and it seems they had sufficient influence to cause its repeal. The death returns for that year (1883) showed that for every thousand deaths two were caused by small-pox; in 1884, there were three; in 1885, seventeen; and in the first quarter of 1886, eighty-five."

BLOOD-CHANGES. — The Paris correspondent of the *New York Medical Journal* says that the application of spectroscopy to the study of pathological alterations in the blood is receiving considerable attention in that city. So far, the considerable expense of the large instruments employed has to a great extent prevented any use being made in medicine of the principal characteristics of the coloring-matter of the blood, either in the normal or in the pathological state; but a late invention of Dr. Hénocque's places in the hands of the medical profession a handy, portable hæmato-spectroscope, that will almost go into a waistcoat pocket, and with which a spectral analysis, both qualitative and quantitative, of hæmoglobin and its derivatives (oxyhæmoglobin, methæmoglobin, etc.), can be made at the bedside. But it will be asked, What is the advantage of knowing this? Well, it has been proved to be of the utmost importance in the study of the variations of the activity of the reduction of oxyhæmoglobin in health and in disease. This Dr. Hénocque makes us *see* with his instrument applied to the thumb. A small elastic-band ligature is tied around the lower part of the thumb, and on the

hæmatoscope being applied to the nail, which is exposed to the usual daylight (as strong as possible, but that from a house-window is enough), the energy of the exchange going on between oxygen and the tissues can be seen. This new idea is of great practical importance in the study of the phenomena of nutrition, both in physiological and in pathological states; so that such physicians as Professor Germain Sée are now taking the matter up and applying it to the study of many pathological states, such as anæmia, etc. Dr. Hénocque is one of Professor Brown-Séquard's best men. He has given the results of some three hundred and seventy cases in which experiments were made.

BOOK-REVIEWS.

Proceedings of the American Society for Psychical Research. Vol. i. No. 3, 1887.

THE appearance of Miss Fletcher's paper upon 'The Supernatural among the Omaha Tribe of Indians,' in the Proceedings of the Psychic Research Society, is of importance, because it shows that this society is in part ready to take the anthropological view of such notions, to find their interest in the recording of such popular beliefs as a contribution to the statistics of human thought with no more reference to their possible objective verification than is necessary to shed light upon their origin. Apart from this, Miss Fletcher's paper is extremely interesting as showing the naturalness with which the supernatural enters into the every-day life of unenlightened people. It is also noteworthy that the Omaha ghost lets himself be heard so much more than seen, while with us the reverse is the case. This fact is very suggestive, and several aids to an explanation present themselves. It is also worth mentioning how little the evolution of terror is associated with the 'ghost-noises' of the Omahas.

All those who have followed the eventful career of the 'Phantasms of the Living' — the depository of the work of the English Psychic Research Society — will read with interest the controversy between Mr. C. S. Peirce, the well-known mathematician and logician, and Mr. Edmund Gurney. The former makes a detailed enumeration of all such cases regarded by Mr. Gurney and his associates as a proof of spontaneous telepathy, and shows that a large proportion of these suffer from serious omissions and fallacies, mainly sinning against the principles of the logic of induction. This brings a lengthy reply from Mr. Gurney, and a still longer rejoinder from Mr. Peirce. The discussion turns upon details, and must be read in full. Two points may be briefly noticed. The first relates to the estimation of the probability of a certain thought occurring to our minds within a given period. This is always a delicate task; and, as so much of our mental activity goes on in the region of the unconscious, it seems safer to make a very liberal estimate in this regard; and, if we do this, a larger number of coincidences of such presentiments as the death of a friend (as prompted by an undefined feeling about his welfare) with the actual occurrence will be attributable to chance. It is through the neglect of this consideration that the evidential value of many of the best cases is decidedly weakened. Next, as Mr. Peirce well argues, if we admit that the cases as they stand defy explanation by ordinary reasoning, it is very easy to invent half a dozen hypotheses explaining the facts as well as does the telepathic theory, and in the minds of many people by no means as improbable as the latter.

The reports of the several committees are more than usually satisfactory. The report of the committee on thought-transferrence, apart from an injudicious closing paragraph, is a frank confession of negative results. The committee on experimental psychology, of which Dr. C. S. Minot is the chairman, give the results of their inquiries as to the prevalence of a feeling sufficiently strong to influence action with reference (1) to sitting down thirteen at table, (2) to beginning a voyage on Friday, (3) to seeing the new moon over your left shoulder. The results are, that both in men and in women the most prevalent superstition is (3); the least prevalent is (1); and that about one man in ten, and two women in ten, acknowledge a belief in these superstitions. Furthermore, the question, whether in choosing between two otherwise equally desirable houses you would be influenced by the reputation of the one as haunted, is answered in the affirmative by forty-four men and sixty-six women in one hundred; but it should be added that a large number place this choice on accessory grounds, and not on the hauntedness of the house. Whether these statistics will be taken as marking the prevalence of frankness or of real superstition, must be left for each to decide.

The reports on haunted houses and on mediumistic phenomena presents few points of interest. The opposite is true of Mr. Cory's admirable observations on hypnotic phenomena. Only a single observation of the many ingenious tests devised by Mr. Cory can here be given. The fact that some hypnotic subjects can associate a suggested hallucination with a blank card, is explained by supposing that some trifling irregularity on the card serves to their hypersensitive senses as the direct excitant of the hallucination. This Mr. Cory supports, and really proves. A pencil with one end slightly nicked is placed on end on a mantel, and the subject is given the suggestion that nothing is upon the mantel. Then eleven other precisely similar pencils are placed on the mantel, when the subject is asked to count them, and counts eleven. A strip of board is so held as to cover the nick on the one pencil, and under this condition the subject counts twelve, showing that the sight of the nick sets the mind so as not to count that pencil.

This valuable number of the Proceedings is concluded with two notes from the pen of Prof. William James. In the first, Professor James gives the results of experiments upon the 're-action time' in the hypnotic state; showing that it is at times longer, and at times shorter, than in the normal state, and that a more detailed analysis of the kind of hypnosis is necessary to explain these results. The other brings together a number of important facts concerning the 'consciousness of lost limbs.'

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

Diamonds in Meteorites.

ON Sept. 4, 1886, a meteoric stone weighing about four pounds fell at Novy Urej, Krasnoslobodsk, in the Government of Penza, Siberia. In this MM. Latchinoff and Jorefeif found what they supposed to be diamonds of microscopic size. In an insoluble residue small corpuscles, showing traces of polarization, were harder than corundum, and having the density and other characteristics of the diamond, and were present to the amount of one per cent of the whole mass (see *Nature*, Dec. 1, 1887). Through the courtesy of his Excellency Julien V. Siemaschko of St. Petersburg, I have been able to procure a small piece of the meteorite. Mr. H. Hensoldt, section-cutter at the School of Mines, very kindly prepared sections of the same, which I found to contain metallic iron in small thin plates, magnetite in small opaque grains, a plagioclase felspar, and olivine in oval grains, but was unable to detect any of these bodies in the sections. Prof. H. Carvill Lewis, to whom I sent the material, informed me that he had extracted two small oval bodies, almost isotropic, and showing no more traces of polarization than occur in many diamonds. With some other fragments of the meteorite, and not with these, he made two good scratches on a polished sapphire. He did not mount the crystals, because they were again lost: so I could not examine them. He was, however, inclined to support the views of the describers.

I found, that, by grinding with a sapphire four particles of the meteorite, I distinctly made a number of minute but deep scratches on each polished face of four different sapphires with each piece of meteorite. These scratches are characteristic of but one mineral that we know, and that is the diamond; but they are evidently so minute, that they form a coating or an aggregate over the other minerals, and were too small to distinguish, but yet exist in quantity, and may also possibly be the amorphous form of the diamond known as carbon or carbonado (?) Small pieces of the meteorite were then boiled for some time in hydrochloric, sulphuric, and nitro-muriatic acids. This readily removed all of the iron and magnetite, leaving only the skeletons of olivine, on which were small black particles, one of which was elongated but rounded, suggesting two joined cubes(?) On crushing one of these olivine pieces